

AMENDMENTS TO THE CLAIMS

1. (Original) A semiconductor package, comprising:
- a semiconductor device supported by a substrate;
- a heat spreader, wherein said heat spreader includes a surface having a central area and a channel, wherein said channel is recessed relative to said central area; and
- a thermal interface material layer disposed between said semiconductor device and said surface of said heat spreader, wherein said thermal interface material layer is to thermally couple said semiconductor device and said heat spreader.
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2. (Original) A semiconductor package as recited in claim 1, wherein a portion of the thermal interface material layer is disposed within said channel.
3. (Original) A semiconductor package as recited in claim 2, wherein the thermal interface material layer comprises solder.
4. (Original) A semiconductor package as recited in claim 3, wherein the heat spreader comprises copper and the solder comprises Indium.
5. (Original) A semiconductor package as recited in claim 3, wherein the channel is plated with a wetting layer.

6. (Original) A semiconductor package as recited in claim 4, wherein the wetting layer comprises gold on electrolytic nickel.

7. (Original) A semiconductor package as recited in claim 6, wherein the channel has a width of between about 0.5 mils to about 5.0 mils and a depth of between about 0.5 mils to about 5.0 mils.

8. (Original) A semiconductor package as recited in claim 6, wherein the heat spreader is disposed above the semiconductor device.

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9. (Original) A semiconductor package as recited in claim 6, wherein the heat spreader is disposed below the semiconductor device.

10. (Original) A semiconductor package as recited in claim 6, wherein the heat spreader is a heat pipe.

11. (Original) A method of forming a semiconductor package, comprising:

providing a semiconductor device;

providing a heat spreader, wherein a surface of said heat spreader includes a central area and a channel, wherein said channel is recessed relative to said central area; and

forming a thermal interface material layer to be disposed between said semiconductor device and said surface of said heat spreader.

12. (Original) A method of forming a semiconductor package as recited in claim 11, wherein a portion of the thermal interface material layer is disposed in the channel.

13. (Original) A method of forming a semiconductor package as recited in claim 12, wherein the thermal interface material layer comprises solder and wherein the heat spreader comprises copper.

14. (Original) A method of forming a semiconductor package as recited in claim 13, wherein the channel is plated with a wetting layer.

15. (Original) A method of forming a semiconductor package as recited in claim 14, wherein the wetting layer comprises gold and electrolytic nickel.

16. (Original) A method of forming a semiconductor package as recited in claim 15, further comprising placing an electric flux on the semiconductor device and the heat spreader.

17. (Original) A method of forming a semiconductor package as recited in claim 16, further comprising applying a force to the heat spreader towards the semiconductor device.

18. (Original) A heat removal package, comprising:

a heat spreader, wherein said heat spreader includes a surface having a central area and a channel, wherein said channel is recessed relative to said central area; and

a thermal interface material layer disposed between a heat sink and said surface of said heat spreader, wherein said thermal interface material layer is to thermally couple said heat sink and said heat spreader.

19. (Original) A heat removal package as recited in claim 18, wherein a portion of the thermal interface material layer is disposed within said channel.

20. (Original) A heat removal package as recited in claim 19, wherein the thermal interface material layer comprises solder.

21. (Original) A heat removal package as recited in claim 20, wherein the solder is Indium.

22. (Original) A heat removal package as recited in claim 20, wherein the channel is plated with a wetting later.

23. (Original) A heat removal package as recited in claim 22, wherein the wetting layer comprises gold on electrolytic nickel.

24. (Original) A heat removal package as recited in claim 23, wherein the channel has a width of between about 0.5 mils to about 5.0 mils and a depth of between about 0.5 mils to about 5.0 mils.

25. (Previously Added) An integrated heat spreader, comprising:

a surface having a central area and a channel, the channel to be recessed relative to the central area, the surface to be thermally coupled to a heat sink by a thermal interface material layer.

26. (Previously Added) An integrated heat spreader as recited in claim 25, wherein a portion of the thermal interface material layer is disposed within the channel.

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27. (Previously Added) An integrated heat spreader as recited in claim 25, wherein the thermal interface material layer comprises solder.

28. (Previously Added) An integrated heat spreader as recited in claim 25, wherein the channel is plated with a wetting layer.

29. (Previously Added) An integrated heat spreader as recited in claim 29, wherein the wetting layer comprises gold on electrolytic nickel.

30. (Previously Added) An integrated heat spreader as recited in claim 25, wherein the channel has a width of between about 0.5 mils to about 5.0 mils and a depth of between about 0.5 mils to about 5.0 mils.
